No. 9500299

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Zeneca (No. 4) Limited

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'ZS1791'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-ninth day of August in the year of our Lord one thousand nine hundred and ninety-seven.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions.*

FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*

~~ZENECA Ltd.~~ Zenco (No. 4) Limited

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

3. VARIETY NAME

ZS1791

JMS 12/6/96

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*

~~ICI Seeds~~
~~2369 330th St., Box 500~~
~~Slater, Iowa 50244~~
15 Stanhope Gate
London W1Y 6LN
England

5. TELEPHONE *(include area code)*

(515) 685-5000

6. FAX *(include area code)*

(515) 685-5080

FOR OFFICIAL USE ONLY

PVPO NUMBER: 9500299

FILING DATE: Sept. 5, 1995

FILING AND EXAMINATION FEE: $ 2450.00

DATE: Sept. 5 1995

CERTIFICATION FEE: $ 300.00

DATE: 14 July 1997

7. GENUS AND SPECIES NAME

Zea mays L.

8. FAMILY NAME *(Botanical)*

Gramineae

9. CROP KIND NAME *(Common name)*

Field Corn

10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.) (Common name)*

Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION

England

12. DATE OF INCORPORATION

April 29, 1992

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

Dana Rewoldt
ICI Seeds
2369 330th St., Box 500
Slater, Iowa 50244

14. TELEPHONE *(include area code)*

(515) 685-5100

15. FAX *(include area code)*

(515) 685-5024

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

a. XX Exhibit A. Origin and Breeding History of the Variety
b. XX Exhibit B. Statement of Distinctness
c. XX Exhibit C. Objective Description of the Variety
d. XX Exhibit D. Additional Description of the Variety
e. XX Exhibit E. Statement of the Basis of the Applicant's Ownership
f. XX Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository)*
g. XX Filing and Examination Fee ($2,450), made payable to "Treasurer of the United States" *(Mail to PVPO)*

17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*

☐ YES *(If "yes," answer items 18 and 19 below)* XX NO *(If "no," go to item 20)*

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☐ YES ☐ NO

19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

XX YES *(If "yes," give names of countries and dates)* ☐ NO

First U.S. sale of hybrid involving this line occurred in December 1994.

21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*

Dana Rewoldt

NAME *(Please print or type)*

DANA REWOLDT

CAPACITY OR TITLE

Attorney for the Company

DATE

8/31/95

SIGNATURE OF APPLICANT *(Owner(s))*

NAME *(Please print or type)*

CAPACITY OR TITLE

DATE

SD-470 (04-96) *(Previous editions are to be destroyed)*

(See reverse for instructions and information collection burden statement)

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EXHIBIT A

ORIGIN AND BREEDING HISTORY OF ZS1791

YEAR	SEASON	BREEDING GENERATION	LOCATION
1983/84	Winter	LH132 ~~PVP8300148~~/LH117 (Self Pollination)	Hawaii
1984	Summer	S0 (Self Pollination)	Nebraska
1987	Summer	S1 (Self Pollination)	Nebraska
1988	Summer	S2 (Self Pollination)	Nebraska
1989	Summer	S3 (Self Pollination)	Nebraska
1989/90	Winter	S4 (Self Pollination)	Hawaii
1990	Summer	S5 (Self Pollination)	Nebraska
1990/91	Winter	S6 (Self Pollination)	Hawaii

JMS 4/24/97

JMS 4/24/1997

Inbred ZS1791 is derived from a cross between PVP certificate ~~#8300148~~ LH132, issued February 22, 1985, and a line from Holden's Foundation Seed Company designated LH117. Breeding methodologies presented in the above table indicate development via self pollination over six generations, and concurrent selection for plant stature, plant health, male and female characteristics (ear size, kernel size, etc.) and expected combining ability with other commercial inbred lines.

Inbred ZS1791 has been closely observed in the inbred maintenance process since the final bulk generation in 1991. Any rogues or variant plants have been carefully removed during the process of inbred maintenance. These rogue or variant plants have occurred at a frequency and type such that they could have been predicted to occur as a result of outcrossing (stray pollen) during the inbred maintenance process. As a result, ZS1791 is true breeding for all traits reported in this application and has remained so through the four increase generations completed since the winter of 1991. Seed resulting from each increase generation has also been evaluated using isozyme analysis to ensure genetic purity. To date, no genetic impurity has been detected using these tests.

JMS 4/24/97

LH117 is not public line but is available for licensing from Holden's Foundation Seed Company.

EXHIBIT B

DISTINCTNESS STATEMENT

Clearly ZS1791 is distinct from the standard inbred B73. The differences are shown in days to plant height, ear height, pollen shed, glume color, cob color, etc.

JMS 4/24/97

Inbred ZS1791 is believed most similar in morphology and usage to the protected variety ~~PVP9200038~~ ICI 441 owned by Zeneca Ltd.

The following table outlines a series of qualitative traits useful in comparing and contrasting these two lines:

JMS 4/24/97

	TRAIT DESCRIPTION	
TRAIT NAME	**ZS1791** (Munsell)	~~**PVP9200038**~~ ICI 441
Anther Color	Green-Yellow (2.5GY 8/10)	Yellow (5GY 8/10)
Glume Color	Green-Red (5GY 6/6 + 2.5R 4/10)	Light Green-Purple (5GY 6/8 + 5R 4/6)
Cob Color	Pink (2.5R 7/8)	Light Red (Munsell 5R 6/10)
Leaf Color	Dark Green (5GY 3/4)	Dark Green (5GY 3/4)
Pollen Shed (0=Sterile to 9=Heavy Shedder)	5	4
Silk Color	Pale Yellow (5Y 8/6)	Light Red (5R 5/6)

Although a number of the traits listed above are similar for these two lines; they are clearly different for anther, silk, and glume color.

JMS 4/24/97

Additional qualitative traits of ~~PVP9200038~~ ICI 441 are presented in Exhibit D.

In addition to the qualitative traits listed above, the following quantitative characteristics compare and contrast ZS1791 with ~~PVP9200038~~ ICI 441.

JMS 4/24/97

EXHIBIT B

ZS1791 VS. ~~PVP9200038~~ ICI 441

YEAR	TRAIT	NUMBER OF EXPTS	ZS1791 MEAN	~~ZS0441~~ ICI 441 MEAN	MEAN DIFF	STD OF DIFF	STD ERR OF MEAN DIFF	95% CI FOR DIFF	T-STAT	PR>T
OVERALL	YIELD	20	82.2	73.1	9.1	12.8	2.85	(3.15,15.14)	3.21	0.0047
1994	YIELD	8	105.7	92.3	13.5	10.5	3.70	(4.96,22.00)	3.64	0.0083
1993	YIELD	7	57.1	47.8	9.3	17.2	6.50	(-6.32,24.86)	1.43	0.2036
1992	YIELD	5	79.8	77.8	2.0	6.1	2.72	(-5.04, 9.10)	0.75	0.4964
OVERALL	PLANT HGT	20	137.0	159.6	-22.7	10.1	2.25	(-27.4,-17.9)	-10	0.0000
1994	PLANT HGT	8	138.9	163.4	-24.4	7.8	2.75	(-30.8,-18.1)	-8.9	0.0000
1993	PLANT HGT	7	131.7	153.1	-21.4	14.5	5.48	(-34.6,-8.25)	-3.9	0.0079
1992	PLANT HGT	5	141.2	162.8	-21.6	7.0	3.14	(-29.7,-13.4)	-6.9	0.0023
OVERALL	EAR HEIGHT	20	55.0	66.2	-11.2	6.2	1.39	(-14.2,-8.32)	-8.1	0.0000
1994	EAR HEIGHT	8	61.0	71.9	-11.0	5.1	1.80	(-15.1,-6.83)	-6.1	0.0005
1993	EAR HEIGHT	7	51.2	62.6	-11.4	8.3	3.15	(-19.0,-3.88)	-3.6	0.0109
1992	EAR HEIGHT	5	50.8	62.2	-11.4	5.9	2.63	(-18.3,-4.58)	-4.3	0.0123
OVERALL	HEATP50	20	1524	1523	1.7	39.9	8.92	(-17.0,20.47)	0.19	0.8477
1994	HEATP50	8	1552	1551	0.4	48.1	17.0	(-38.7,39.51)	0.02	0.9824
1993	HEATP50	7	1550	1555	-4.7	42.7	16.1	(-43.4,34.05)	-.29	0.7824
1992	HEATP50	5	1444	1431	12.9	23.5	10.5	(-14.4,40.12)	1.23	0.2877
OVERALL	HEATS50	20	1555	1548	7.3	51.2	11.5	(-16.8,31.36)	0.64	0.5315
1994	HEATS50	8	1566	1565	0.5	68.2	24.1	(-55.0,55.90)	0.02	0.9848
1993	HEATS50	7	1596	1584	12.4	43.6	16.5	(-27.1,51.96)	0.75	0.4791
1992	HEATS50	5	1482	1471	11.1	36.5	16.3	(-31.4,53.53)	0.68	0.5359
OVERALL	% SML RND	20	7.2	4.5	2.7	2.0	0.45	(1.77, 3.65)	6.05	0.0000
1994	% SML RND	8	5.0	2.4	2.6	2.0	0.72	(0.92, 4.24)	3.57	0.0091
1993	% SML RND	7	11.1	7.6	3.4	2.3	0.87	(1.35, 5.53)	3.94	0.0076
1992	% SML RND	5	5.4	3.5	1.9	1.4	0.63	(0.26, 3.53)	3.01	0.0396
OVERALL	% SML FLAT	20	8.7	2.3	6.5	4.7	1.04	(4.30, 8.68)	6.21	0.0000
1994	% SML FLAT	8	5.5	0.6	4.9	1.3	0.45	(3.89, 5.95)	11.0	0.0000
1993	% SML FLAT	7	15.2	4.6	10.6	5.6	2.12	(5.55,15.72)	5.02	0.0024
1992	% SML FLAT	5	4.8	1.6	3.2	2.3	1.01	(0.58, 5.82)	3.17	0.0338

EXHIBIT B (CONTINUATION) FOR ZS1791

Following are descriptions which clarify headings within the previous table.

YEAR = The year testing was done. "OVERALL" indicates the mean of all data collected across all experiments.

NUMBER OF EXPTS = The number of locations at which the two lines being compared were grown "head to head" in an experiment.

ZS1791 MEAN = The trait mean across experiments within (or across) years for ZS1791.

ICI 441
~~ZS0441~~ MEAN = The trait mean across experiments within (or across) years for ~~ZS0441~~. ICI 441

MEAN DIFF = The mean of the single environment differences in the trait characteristic between the lines for comparison within (or across) years.

SMS 4/24/97

STD OF DIFF = The standard deviation of the trait difference on a single location basis.

STD ERR OF MEAN DIFF = The standard error of the mean trait difference within (or across) years.

95% CI FOR DIFF = The 95% confidence interval for the mean trait difference within (or across) years.

T-STAT = The actual t-statistic calculated at the alpha=0.05 level.

PR>T = The probability that a greater value of T-STAT would be observed if there were no true difference within (or across) years.

Data presented in the above table demonstrate several clear quantitative differences between the two inbreds.

"OVERALL" YIELD of ZS1791 is not significantly different than that of ICI ~~ZS0~~441 (82.2 versus 73.1 Bu/A).

ICI 441 Mean plant height across years (PLANT HGT) of ZS1791 is 22.7 cm shorter than ~~PVP9200038~~, which is significant. Additionally, the EAR HEIGHT difference (11.2 cm) between ZS1791 and ~~PVP9200038~~ is also significant.

ICI 441

JMS 4/24/9

ICI 441 Flowering data did not suggest a significant difference between ZS1791 and ~~PVP9200038~~ for either heat units to 50% pollen shed (HEATP50) or to 50% silk emergence (HEATS50).

Although ZS1791 does produce slightly more small round and small flat seeds, this is not a significant difference.

Statistics shown in this table apply to "MEAN DIFF".

The key statistic listed in the table for demonstrating the validity of the claim of differences between the two inbreds is the paired t-test for locations in which both inbreds were grown in the same experiment. Each location provides a separate environment as the basis for pairing. In each environment, the value of a variable for each inbred is the average over reps. The traits shown in the table above which provide evidence for the differentiation between these inbreds are approximately normally distributed, and mean differences for the number of environments presented here are likely to be normally distributed even if the original distributions are not (Snedecor and Cochran, 1989, Statistical methods 8th Ed. pp. 44-47). Therefore, the use of the t-distribution for mean differences is justified (Snedecor and Cochran, 1989, pp. 55-56, 83-89).

FORM GR-470-28
(9-1-92)

EXHIBIT C
(Corn; Maize)

United States Department of Agriculture, Agricultural Marketing Service
Commodities Scientific Support Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
CORN (Zea mays L.)

Name of Applicant(s)	Variety Seed Source	Variety Name or Temporary Designation
Zeneca Ltd.		ZS1791

Address (Street & No., or R.F.D. No., City, State, Zip Code and Country)

15 Stanhope Gate, London, England W1Y 6LN

FOR OFFICIAL USE
PVPO Number 9500299

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a '*' are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #25 and #26 in Comments section):

01=Light Green	06=Pale Yellow	11=Pink	16=Pale Purple	21=Buff
02=Medium Green	07=Yellow	12=Light Red	17=Purple	22=Tan
03=Dark Green	08=Yellow-Orange	13=Cherry Red	18=Colorless	23=Brown
04=Very Dark Green	09=Salmon	14=Red	19=White	24=Bronze
05=Green-Yellow	10=Pink-Orange	15=Red & White	20=White Capped	25=Variegated (Describe)
				26=Other (Describe)

STANDARD INBRED CHOICES (Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data):

Yellow Dent Families:

Family	Members
B14	CM105, A632, B64, B68
B37	B37, B76, H84
B73	N192, A679, B73, NC268
C103	Mo17, Va102, Va35, A682
Oh43	A619, MS71, H99, Va26
WF9	W64A, A554, A654, Pa91

Yellow Dent (Unrelated):
Co109, ND246,
Oh7, T232
W117, W153R
W182BN

White Dent:
CI66, H105, Ky228

Sweet Corn:
C13, Iowa5125, P39, 2132

Popcorn:
SG1533, 4722, HP301, HP7211

Pipecorn:
Mo15W, Mo16W, Mo24W

1. TYPE: (describe intermediate types in Comments section)

* 2 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental 7=Pipecorn

Standard Inbred Name B73

2. REGION WHERE DEVELOPED IN THE U.S.A.:

* 7 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other West

Standard Seed Source 2 N. Central Regional Plant Plant Introduction Station : ~~Ames, Iowa~~

3. MATURITY (In Region of Best Adaptability; show Heat Unit formula in "Comments" section):

	DAYS	HEAT UNITS		DAYS	HEAT UNITS
*	80	1514.	From ~~emergence~~ planting to 50% of plants in silk	82	1558.
*	80	1514.	From ~~emergence~~ planting to 50% of plants in pollen	81	1537.
	10	____.	From 10% to 90% pollen shed	8	____.
(*)	___	____.	From 50% silk to optimum edible quality	___	____.
	___	____.	From 50% silk to harvest at 25% moisture	___	____.

4. PLANT:		Standard Deviation	Sample Size		Standard Deviation	Sample Size
* 1298	cm Plant Height (to tassel tip)	6.28	15	1867	8.19	15
* 55.33	cm Ear Height (to base of top ear node)	5.43	15	94.33	9.96	15
9.50	cm Length of Top Ear Internode	0.71	15	15.13	1.03	15
0.00	Average Number of Tillers	0.00	15	0.07	~~0.26~~	~~15~~
1.67	Average Number of Ears per Stalk	0.49	15	1.27	0.46	~~15~~
4	Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark			4		

7

Application Variety Data ZS1791 — Page 2 — Standard Inbred Data B73

		Standard Deviation	Sample Size	Standard Inbred Data	Standard Deviation	Sample Size
5. LEAF:						
*	8.80 cm Width of Ear Node Leaf	0.37	15	~~9.57~~	~~1.03~~	~~15~~
*	8 6.93 cm Length of Ear Node Leaf	5.22	15	~~9 6.20~~	~~5.06~~	~~15~~
*	6.13 Number of leaves above top ear	0.35	15	~~5.93~~	~~0.46~~	~~15~~
	33.27 degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf)	6.49	15	23.33	~~3.58~~	~~15~~
*	3 Leaf Color (Munsell code 5GY 3/4)			3 (Munsell code 5GY 3/4)		
	7 Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)			5		
	4 Marginal Waves (Rate on scale from 1=none to 9=many)			4		
	8 Longitudinal Creases (Rate on scale from 1=none to 9=many)			5		
6. TASSEL:						
*	6.00 Number of Primary Lateral Branches	1.00	15	7.20	0.86	15
	21.27 Branch Angle from Central Spike	4.40	15	9.20	2.43	15
*	37.87 cm Tassel Length (from top leaf collar to tassel tip)	3.38	15	39.73	3.49	15
	5 Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)			7		
	5 Anther Color (Munsell code 2.5GY 8/10)			7 (Munsell code 5Y 8/8)		
	02 w/14 Glume Color (Munsell code 5GY 6/6 w/ 2.5R 4/10 Stripes)			2 (Munsell code 5GY 6/8)		
	2 Bar Glumes (Glume Bands): 1=Absent 2=Present			2		
7a. EAR (Unhusked Data):						
*	6 Silk Color (3 days after emergence) (Munsell code 5Y 8/6)			6 (Munsell code 5Y 8/4)		
	2 Fresh Husk Color (25 days after 50% silking) (Munsell code 5GY 5/8)			1 (Munsell code 2.5GY 6/8)		
	22 Dry Husk Color (65 days after 50% Silking) (Munsell code 2.5Y 8/4)			22 (Munsell code 2.5Y 8/4)		
*	1 Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendent			2		
	5 Husk Tightness (Rate on scale from 1=very loose to 9=very tight)			5		
	2 Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium ((8 cm) 3=Long (8-10 cm beyond ear tip) 4=Very Long ()10 cm)			2		
7b. EAR (Husked Ear Data):						
*	15.01 cm Ear Length	0.70	15	13.21	0.63	15
*	44.14 mm Ear Diameter at mid-point	1.90	15	45.54	1.84	15
	143.8 gm Ear Weight	20.32	15	128.8	18.92	15
*	15.87 Number of Kernel Rows	1.92	15	16.53	1.41	15
	2 Kernel Rows: 1=Indistinct 2=Distinct			2		
	1 Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral			1		
	7.83 cm Shank Length	0.88	15	6.83	1.39	15
	2 Ear Taper: 1=Slight 2=Average 3=Extreme			2		

Note: Use chart on first page to choose color codes for color traits.

Application Variety Data ZS1791 | Page 3 | Standard Inbred Data B73

8. KERNEL (Dried):

		Standard Deviation	Sample Size		Standard Deviation	Sample Size
1 1.53	mm Kernel Length	0.81	15	1 1.01	0.95	15
7.43	mm Kernel Width	0.61	15	7.65	0.45	15
4.46	mm Kernel Thickness	0.48	15	4.87	0.84	15
2 6.69	% Round Kernels (Shape Grade)	8.27	15	2 9.30	6.46	15
1	Aleurone Color Pattern: 1=Homozygous 2=Segregating			1		
(*) 8	Aleurone Color (Munsell code 2.5Y 8/10)			8	(Munsell code 2.5Y 8/10)	
* 8	Hard Endosperm Color (Munsell code 2.5Y 8/10)			8	(Munsell code 5Y 7/10)	
* 3	Endosperm Type: 1=Sweet (su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other			3		
-2 6.31	gm Weight per 100 Kernels (unsized sample)	2.13	15	2 5.76	2.30	15

9. COB:

		Standard Deviation	Sample Size		Standard Deviation	Sample Size
* 2 5.51	mm Cob Diameter at mid-point	0.61	15	2 8.09	1.71	15
1 1	Cob Color (Munsell code 2.5R 7/8)			1 4	(Munsell code 10R 5/8)	

10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):

	A. Leaf Blights, Wilts, and Local Infection Diseases			
	Anthracnose Leaf Blight (Colletotrichum graminicola)			
4.8	Common Rust (Puccinia sorghi)		6.5	
	Common Smut (Ustilago maydis)		5.0	
	Eyespot (Kabatiella zeae)			
2.0	Goss's Wilt (Clavibacter michiganense spp. nebraskense)		4.7	
4.0	Gray Leaf Spot (Cercospora zeae-maydis)		3.1	
	Helminthosporium Leaf Spot (Bipolaris zeicola)	Race		Race
4.0	Northern Leaf Blight (Exserohilum turcicum)	Race	7.0	Race
	Southern Leaf Blight (Bipolaris maydis)	Race	4.4	Race
	Southern Rust (Puccinia polysora)			
	Stewart's Wilt (Erwinia stewartii)		6.0	
	Other (Specify)			
	B. Systemic Diseases			
	Corn Lethal Necrosis (MCMV and MDMV)			
	Head Smut (Sphacelotheca reiliana)			
	Maize Chlorotic Dwarf Virus (MCDV)			
	Maize Chlorotic Mottle Virus (MCMV)			
2.0	Maize Dwarf Mosaic Virus (MDMV)	Strain B	2.0	Strain B
	Sorghum Downy Mildew of Corn (Peronosclerospora sorghi)			
	Other (Specify)		7.5	MDMV STRAIN A
	C. Stalk Rots			
	Anthracnose Stalk Rot (Colletotrichum graminicola)			
	Diplodia Stalk Rot (Stenocarpella maydis)		5.3	
	Fusarium Stalk Rot (Fusarium moniliforme)			
	Gibberella Stalk Rot (Gibberella zeae)			
	Other (Specify)			
	D. Ear and Kernel Rots			
	Aspergillus Ear and Kernel Rot (Aspergillus flavus)			
	Diplodia Ear Rot (Stenocarpella maydis)			
	Fusarium Ear and Kernel Rot (Fusarium moniliforme)			
	Gibberella Ear Rot (Gibberella zeae)			
	Other (Specify)			

Note: Use chart on first page to choose color codes for color traits.

Application Variety Data ZS1791 | Page 4 | Standard Inbred Data B73

II. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested):

		Standard Deviation	Sample Size		Standard Deviation	Sample Size
__	Banks Grass Mite (Oligonychus pratensis)			__		
	Corn Earworm (Helicoverpa zea)					
__	Leaf-Feeding			__		
	Silk Feeding :					
	__ __ __.__ mg larval wt.			__ __ __.__		
__	Ear Damage					
__	Corn Leaf Aphid (Rhopalosiphum maidis)			__		
__	Corn Sap Beetle (Carpophilus dimidiatus)			__		
	European Corn Borer (Ostrinia nubilalis)					
6.6	1st Generation (Typically Whorl Leaf Feeding)			4.4		
5.7	2nd Generation (Typically Leaf Sheath-Collar Feeding)			2.5		
	Stalk Tunneling :					
	__ 26.0 cm tunneled/plant		2 YEARS	__ 2 80		
	Fall Armyworm (Spodoptera frugiperda)					
__	Leaf-Feeding			__		
	Silk-Feeding :			__		
	__ __ __.__ mg larval wt.			__ __ __.__		
__	Maize Weevil (Sitophilus zeamaize)					
__	Northern Rootworm (Diabrotica barberi)			__		
__	Southern Rootworm (Diabrotica undecimpunctata)			__		
	Southwestern Corn Borer (Diatraea grandiosella)					
__	Leaf Feeding			__		
	Stalk Tunneling :					
	__ __.__ cm tunneled/plant			__ __ __.__		
__	Two-spotted Spider Mite (Tetranychus urticae)					
__	Western Rootworm (Diabrotica virgifera virgifera)			__		
__	Other (Specify) _____			__ _____		

12. AGRONOMIC TRAITS:

__	Stay Green (at 65 days after anthesis) (Rate on a scale from 1=worst to 9=excellent.)	__
__ __.__	% Dropped Ears (at 65 days after anthesis)	__ __.__
__ __.__	% Pre-anthesis Brittle Snapping	__ __.__
__ __.__	% Pre-anthesis Root Lodging	__ __.__
__ __.__	% Post-anthesis Root Lodging (at 65 days after anthesis)	__ __.__
__ __ __.__	Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)	__ __ __.__

13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied)

__ Isozymes __ RFLP's __ RAPD's

REFERENCES:

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Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959.
U.S. Department of Agriculture. 1936, 1937. Yearbook.

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D):

COMMENTS

Heat Units Calculated by the Barger Method.

Note for Exhibit C: Some of the data was collected at a location near Slater, Iowa, specifically for PVP note taking purposes. Data for those traits in Exhibit B represent averages of data collected from multiple corn belt locations and thus may differ slightly from Exhibit C as the sources differ.

EXHIBIT D

ADDITIONAL DESCRIPTION OF VARIETY

Additional inbred characteristics are contained in the following two tables for both qualitative and quantitative characteristics. Data presented in these two tables were collected per the data collection protocols outlined in the new PVP data collection procedures which were in full implementation after the fall of 1994. Column headings in the second table are defined as follows:

N = Number of plants observed.

MEAN = Average value of the trait.

STD = Standard deviation of the trait value.

95% CI = 95 percent confidence interval for the trait value.

1994 PRODUCTION TECHNOLOGY PVP TRAITS

JMS 4/24/97

INBRED ~~PVP9200038~~ ICI 441

EXHIBIT D

	N	MEAN	STD.	T-STAT	PROB	95% CI
EAR HEIGHT(CM)	15	61.07	3.71	63.71	0.0000	(59.19,62.95)
LENGTH OF PRIMARY EAR LEAF(CM)	15	96.07	2.52	147.6	0.0000	(94.79,97.34)
WIDTH OF PRIMARY EAR LEAF(CM)	15	8.47	0.58	56.39	0.0000	(8.17, 8.76)
TOP EAR INTERNODE(CM)	15	13.13	0.79	64.40	0.0000	(12.73,13.53)
DEGREE OF LEAF ANGLE	15	25.13	5.94	16.39	0.0000	(22.13,28.14)
# OF EARS PER PLANT	15	1.00	0.00			(1.00, 1.00)
# OF LEAVES ABOVE TOP EAR	15	5.53	0.52	41.50	0.0000	(5.27, 5.79)
# OF PRIMARY LATERAL TASSEL BRANCHES	15	4.53	1.06	16.56	0.0000	(4.00, 5.07)
PLANT HEIGHT(CM)	15	151.1	9.61	60.94	0.0000	(146.3,156.0)
TASSEL LENGTH(CM)	15	46.07	2.63	67.80	0.0000	(44.74,47.40)
TASSEL BRANCH ANGLE	15	13.13	3.38	15.06	0.0000	(11.42,14.84)
# OF TILLER PER PLANTS	15	0.00	0.00			(0.00, 0.00)
WEIGHT PER 100 KERNELS(GM)	15	31.71	1.90	64.74	0.0000	(30.75,32.67)
EAR LENGTH(CM)	15	14.31	1.02	54.20	0.0000	(13.79,14.82)
EAR WEIGHT(GM)	15	140.0	19.85	27.32	0.0000	(130.0,150.1)
# OF KERNEL ROWS	15	14.13	0.92	59.79	0.0000	(13.67,14.60)
COB DIAMETER AT MID-POINT(MM)	15	25.62	0.67	148.8	0.0000	(25.28,25.96)
EAR DIAMETER AT MID-POINT(MM)	15	43.71	1.23	137.5	0.0000	(43.09,44.34)
KERNEL LENGTH(MM)	15	11.33	0.69	64.04	0.0000	(10.98,11.67)
KERNEL THICKNESS(MM)	15	4.85	0.69	27.34	0.0000	(4.51, 5.20)
KERNEL WIDTH(MM)	15	8.28	0.55	58.52	0.0000	(8.00, 8.56)
% ROUND KERNELS(SHAPE GRADE)	15	42.25	7.26	22.54	0.0000	(38.57,45.92)
SHANK LENGTH	15	8.50	1.72	19.17	0.0000	(7.63, 9.37)

ZS1791

JWS 4/24/97

INBRED ~~PVP9200038~~ ICI 441 EXHIBIT D

#3 MATURITY		
DAYS	HEATUNITS	
79	1493	FROM PLANTING TO 50% OF PLANTS IN SILK
79	1493	FROM PLANTING TO 50% OF PLANTS IN POLLEN
9		FROM 10% TO 90% POLLEN SHED
#4 PLANT		
DATA		
4		ANTHOCYANIN OF BRACE ROOTS: 1=ABSENT 2=FAINT 3=MODERATE 4=DARK
#5 LEAF		
COLOR/DATA		
3/DARK GREEN		LEAF COLOR **MUNSELL CODE-5GY 3/4
6		LEAF SHEATH PUBESCENCE (1=NONE TO 9=PEACH FUZZ)
5		MARGINAL WAVES (1=NONE TO 9=MANY)
4		LONGITUDINAL CREASES (1=NONE TO 9=MANY)
#6 TASSEL		
COLOR/DATA		
4		POLLEN SHED (0=STERILE TO 9=HEAVY SHEDDER)
7/YELLOW		ANTHER COLOR **MUNSELL CODE-5Y 8/10
1w/17		GLUME COLOR **MUNSELL CODE-5GY 6/8 w/5R 4/6
2		BAR GLUME: 1=ABSENT 2=PRESENT
#7A EAR (UNHUSKED DATA)		
COLOR/DATA		
12/LIGHT RED		SILK COLOR (3 DAYS AFTER EMERGE) **MUNSELL CODE-5R 5/6
1/LIGHT GREEN		FRESH HUSK (25 DAYS AFTER 50% SILK) **MUNSELL CODE-2.5GY 7/8
6/PALE YELLOW		DRY HUSK COLOR (65 DAYS AFTER 50% SILK **MUNSELL CODE-5Y 8/6
2		POSITION OF EAR AT DRY HUSK: 1=UPRIGHT 2=HORIZONTAL 3=PENDENT
3		HUSK TIGHTNESS (1=VERY LOOSE TO 9=VERY TIGHT)
2		HUSK EXTENSION AT HARVEST: 1=EXPOSED EAR 2=8CM 3=8-10CM 4=>10CM
#7B EAR (HUSKED DATA)		
DATA		
2		KERNEL ROWS: 1=INDISTINCT 2=DISTINCT
1		ROW ALIGNMENT: 1=STRAIT 2=SLIGHT CURVE 3=SPIRAL
2		EAR TAPPER: 1=STRAIT 2=AVERAGE 3=EXTREME
#8 KERNEL (DRY)		
COLOR/DATA		
1		ALEURONE COLOR PATTERN: 1=HOMO 2=SEG
7/YELLOW		ALEURONE COLOR **MUNSELL CODE-2.5Y 8/10
8/YELLOW-ORANGE		HARD ENDOSPERM COLOR **MUNSELL CODE-2.5Y 7/10
3		ENDOSPERM TYPE
7/YELLOW		CROWN COLOR
#9 COB		
COLOR		
12/LIGHT RED		COB COLOR

ZS1791

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055 EXPIRES: 12-31-96

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)

Zenco (No. 4) Limited

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

3. VARIETY NAME

ZS1791

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*

15 Stanhope Gate
London W1Y 6LN
England

5. TELEPHONE *(include area code)*

(515) 685-5100

6. FAX *(include area code)*

(515) 685-5024

7. PVPO NUMBER

9500299

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* If no, please explain. [XX] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? If no, give name of country The Netherlands [ ] YES [X] NO

10. Is the applicant the original breeder? If no, please answer the following: [X] YES [ ] NO

a. If original rights to variety were owned by individual(s): Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country _____

[ ] YES [ ] NO

b. If original rights to variety were owned by a company: Is the original breeder(s) U.S. based company? If no, give name of country _____

11. Additional explantion on ownership *(If needed, use reverse for extra space):*

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. **If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.**

2. **If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.**

3. **If the applicant is an owner who is not the original breeder, both the original breeder and the applicant must meet one of the above criteria.**

The original breeder may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

EXHIBIT E

STATEMENT OF THE BASIS FOR APPLICANT'S OWNERSHIP

ZENECA, Ltd. (Parent Company of ICI Seeds) has paid ICI Seeds for the development of this inbred. ICI Seeds is the employer of Plant Breeder(s) involved in the selection and development of ZS1791. Thus ZENECA, Ltd. has the sole rights and ownership of ZS1791.

9500299

CUSHMAN DARBY & CUSHMAN, L.L.P.

Attorneys at Law
Since 1892

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August 14, 1996

Ms. Stanton
United States Plant Variety
Protection Office
NAL Building, Room 500
1031 Baltimore Boulevard
Beltsville, Maryland 20705-2351

RE: Assignment of PVP Certificates
Our Ref: PNK:70596/220265

Dear Ms. Stanton:

Herewith assignment letter for the listed PVP certificates dated July 22, 1996.

The assignment transfers ownership of the specified PVP certificates from Zeneca Limited to Zenco (No. 4) Limited. Our check for the required fee ($25.00 per certificate) made payable to the "U.S. Treasury" is also attached.

Acknowledgement of the receipt of this assignment is requested.

If there are any questions or if we need to do anything else, please advise.

Respectfully submitted,

CUSHMAN DARBY & CUSHMAN, L.L.P.

By _____
Paul N. Kokulis
Reg. No. 16773

PNK:mh
Attachment
Phone: (202) 861-3503

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9500299

ZENECA

ZENECA Agrochemicals
Jealott's Hill Research Station
Bracknell
Berkshire RG42 6ET
UK

Telephone (01344) 424701
Telex 847556
Fax (01344) 55629

Plant Variety Protection Office
NAL Building, Room 500
1031 Baltimore Blvd
Beltsville, MD 20705-2351
USA

FOR THE ATTENTION OF MARSHA A STANTON

Your Ref	Our Ref	Direct Line	Direct Fax	Tel ext	Date
		01344 414339	01344 481112	4339	22 July 1996

Dear Ms Stanton

ASSIGNMENT OF PVP CERTIFICATES

ZENECA LIMITED of 15 Stanhope Gate, London W1Y 6LN, England, a company created and existing under the laws of England, is the owner of the following PVP Certificates now registered in the United States Plant Variety Protection Office:

Field Corn Application Numbers

9200037, 'ICI193'
9200038, 'ICI441'
9200039, 'ICI740'
9200041, 'ICI986'
~~9300048, 'ICI530'~~
9300304, 'ZS365'
9300305, 'ZS635'
9400261, 'ZS0114'
~~9400259, 'ZS0853'~~
9400260, 'ZS1513'
9500295, 'ZS1022'
9500296, 'ZS0541'
9500297, 'ZS1202'
9500298 ~~9500398, 'ZS1284'~~
9500299, 'ZS1791'
9500300, 'ZS1679'
9500301, 'ZS1783'

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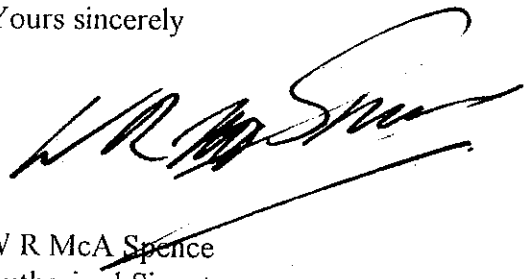
WHEREAS ZENCO (NO.4) LIMITED of 15 Stanhope Gate, London W1Y 6LN, a company created and existing under the laws of England, is desirous of acquiring said registered PVP Certificates.

NOW, THEREFORE, in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration Zeneca Limited hereby assigns to Zenco (No.4) Limited all right, title and interest in the United States in and to said PVP Certificates.

Yours sincerely



W R McA Spence
Authorised Signatory

CERTIFICATE OF INCORPORATION

ON CHANGE OF NAME

Company No. 2908082

The Registrar of Companies for England and Wales hereby certifies that

ZENCO (NO. 4) LIMITED

having by special resolution changed its name, is now incorporated

under the name of

ADVANTA TECHNOLOGY LIMITED

Given at Companies House, Cardiff, the 14th April 1999

THE OFFICIAL SEAL OF THE
REGISTRAR OF COMPANIES

COMPANIES HOUSE